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## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 February 2001 (13.02.01)	
International application No. PCT/US00/17007	Applicant's or agent's file reference 7630/JB
International filing date (day/month/year) 20 June 2000 (20.06.00)	Priority date (day/month/year) 21 June 1999 (21.06.99)
Applicant GARTSTEIN, Vladimir et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
 27 December 2000 (27.12.00)

☐ in a notice effecting later election filed with the International Bureau on:  
 \_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Claudio Borton  Telephone No.: (41-22) 338.83.38
---	--

47  
Translation

PATENT COOPERATION TREATY

PCT

10/088,302

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

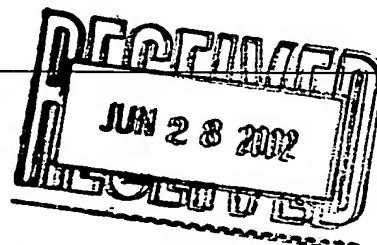
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P23920-PO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/JP00/07036	International filing date (day/month/year) 10 October 2000 (10.10.00)	Priority date (day/month/year) 14 October 1999 (14.10.99)
International Patent Classification (IPC) or national classification and IPC H01M 8/02, 8/10		
Applicant MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.



- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19 February 2001 (19.02.01)	Date of completion of this report 13 November 2001 (13.11.2001)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/JP00/07036

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 1-3.5-12 as originally filed  
pages 4 filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages 1.2.4.5 as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages 3 filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages 2/4-4/4 as originally filed  
pages 1/4 filed with the demand  
pages \_\_\_\_\_, filed with the letter of 02 May 2002 (02.05.2002)
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_ as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or §5.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box. (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-5	YES
	Claims		NO
Inventive step (IS)	Claims	2-5	YES
	Claims	1	NO
Industrial applicability (IA)	Claims	1-5	YES
	Claims		NO

2. Citations and explanations

Document 1: JP, 11-219713, A (Nisshin Steel Co., Ltd.),  
10 August 1999 (10.08.99); claims and  
paragraphs [0001] to [0023]

Document 2: JP, 11-273693, A (Nisshin Steel Co., Ltd.), 8  
October 1999 (08.10.99); claims and  
paragraphs [0001] to [0026]

Document 3: JP, 10-270062, A (Sanyo Electric Co., Ltd.),  
9 October 1998 (09.10.98); claims and  
paragraphs [0001] to [0014]

The invention set forth in Claim 1 does not involve an inventive step in the light of Documents 1-3, cited in the international search report. A person skilled in the art could easily use an electrically conductive coating film including electrically conductive particles and glass disclosed in Document 3 as the acid-resistant electrically conductive coating film in a polymer electrolyte type fuel cell disclosed in Document 1 or 2 wherein the surface of the conductive separator plate having the gas flow path is formed of sheet metal with an acid-resistant coating film formed thereon.

None of the documents cited in the international search report takes away the novelty or inventive step of

the inventions set forth in Claims 2-5. None of the documents cited in the international search report discloses or suggests a polymer electrolyte type fuel cell in which the surface of the conductive separator plate having the gas flow path is formed of sheet metal with an electrically conductive coating film including electrically conductive particles and glass formed thereon, wherein the glass forming the electrically conductive coating film is low-alkali glass.

REC'D 15 OCT 2001

WIPO PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 7630/JB	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/17007	International filing date (day/month/year) 20/06/2000	Priority date (day/month/year) 21/06/1999
International Patent Classification (IPC) or national classification and IPC H01M10/48		
Applicant THE PROCTER & GAMBLE COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 2 sheets.

## 3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 27/12/2000	Date of completion of this report 04.10.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Miot, F Telephone No. +49 89 2399 2714 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/17007

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

1-10 as originally filed

### Claims, No.:

1-10 as received on 16/08/2001 with letter of 13/08/2001

### Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/17007

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

**see separate sheet**

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	3-10
	No:	Claims	1-2
Inventive step (IS)	Yes:	Claims	
	No:	Claims	3-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/US00/17007

With respect to Section I.

1. The applicant has amended claim 1 by introducing the expression: "said housing is externally connected to said electrochemical cell".  
The applicant alleges that support for this amendment is found on page 6, lines 6-7 and figs 4-5 of the specification as originally filed.  
Since page 6, lines 6-7 state only: "...an assembled battery. The retaining ring 13 is preferably made of an insulating or dielectric material." and since figs. 4 and 5 do not show how the "housing is externally connected to said electrochemical cell", the passages of the specification submitted by the applicant cannot be regarded as supporting the amendment introduced in the amended claim filed with letter of 13.08.01.  
Also the statement on page 7, lines 5-6, namely "...the assembled housing 10 containing the electronic circuitry 16 is physically and electrically connected to an electrochemical cell 22." cannot support the claimed amendment because it does not specify whether the housing is connected externally.  
Thus, the expression: "said housing is externally connected to said electrochemical cell" has to be regarded as introducing subject-matter which extends beyond the content of the application as filed; see Art 34(2b) PCT.  
For the above reason the examination has to be carried out as if the claimed amendment had not been made.

With respect to Section V.

1. From Patent Abstracts of Japan , vol. 1995, No11, 26.12.95 & JP-A-07201358, 04.08.95, hereinafter referred to as D1, there is known (see abstract and figure) a battery comprising:
  - (a) a container 3 having a positive terminal and a negative terminal;
  - (b) an electrochemical cell 1 disposed within said container 3, said cell having a positive electrode, a negative electrode, and a cell voltage measured across said positive and said negative electrodes of said cell; and
  - (c) a housing 41 containing electronic circuitry 31 associated with said container, said electronic circuitry electrically connected between said electrodes of said cell and said terminals of said container to create an output voltage measured across said positive and said negative terminals of said container.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/US00/17007

Thus, the subject-matter of claim 1 is not novel.

2. The subject-matter of the characterizing feature of claim 2 is also known from D1; see figure.
3. Dependent claims 3-10 do not appear to contain any additional features which involve an inventive step when combined with the subject matter of any claim to which it refers.

With respect to Section VII.

1. The features of the claim/s are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

**WHAT IS CLAIMED IS:**

1. A battery comprising:
  - (a) a container having a positive terminal and a negative terminal;
  - (b) an electrochemical cell disposed within said container, said cell having a positive electrode, a negative electrode, and a cell voltage measured across said positive and said negative electrodes of said cell; and characterized in that
  - (c) a housing containing electronic circuitry associated with said container, said electronic circuitry electrically connected between said electrodes of said cell and said terminals of said container to create an output voltage measured across said positive and said negative terminals of said container.
2. The battery of Claim 1, wherein said electronic circuitry is substantially physically isolated from said electrochemical cell.
3. The battery of Claim 1, wherein said housing includes a bezel, a circuit board and a retaining ring, said bezel and said retaining ring form a compartment, said circuit board being located within said compartment.
4. The battery of Claim 3, wherein said compartment is sealed.
5. The battery of Claim 3, wherein at least a portion of said housing is translucent or translucent, and said circuit board includes a visual indicator.
6. The battery of Claim 3, wherein said bezel and said retaining ring include a notch.
7. The battery of Claim 3, wherein said circuit board includes a positive input contact, a negative input contact and an output contact electrically connected to said positive terminal or said negative terminal of said container.

*Replated by Article 34*

8. The battery of Claim 3, further comprising a second output contact, said second output contact being electrically connected to one or more of the group of: an indicator external to said compartment and an external device.
9. The battery of Claim 3, wherein said bezel includes a button to activate an indicator.
10. The battery of Claim 3, wherein said circuit board includes a controller.

# INTERNATIONAL PATENT COOPERATION TREATY

*Confirmation of fax!*

RECEIVED

JUN 20 2001

P. O. Box 11 Division  
International PCT

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

REED, David T.  
THE PROCTER & GAMBLE COMPANY  
5299 Spring Grove Avenue  
CINCINNATI, OHIO 45217-1087  
ETATS-UNIS D'AMERIQUE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing  
(day/month/year) 15.06.2001

Applicant's or agent's file reference  
7630/JB

**REPLY DUE** within 2 month(s)  
from the above date of mailing

International application No.  
PCT/US00/17007

International filing date (day/month/year)  
20/06/2000

Priority date (day/month/year)  
21/06/1999

International Patent Classification (IPC) or both national classification and IPC  
H01M10/48

Applicant  
THE PROCTER & GAMBLE COMPANY et al.


1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain document cited
  - VII ☒ Certain defects in the international application
  - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.
 

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

**If no reply is filed,** the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 21/10/2001.

Name and mailing address of the international preliminary examining authority:  
 European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Miot, F

Formalities officer (incl. extension of time limits)  
Baumann, H  
Telephone No. +49 89 2399 2131



**I. Basis of the opinion**

1. With regard to the **elements** of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"):

**Description, pages:**

1-10 as originally filed

**Claims, No.:**

1-10 as originally filed

**Drawings, sheets:**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**WRITTEN OPINION**

International application No. PCT/US00/17007

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-2 no
Inventive step (IS)	Claims	3-10 no
Industrial applicability (IA)	Claims	1-10 yes

2. Citations and explanations  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**



With respect to Section V.

1. From Patent Abstracts of Japan , vol. 1995, No11, 26.12.95 & JP-A-07201358, 04.08.95, hereinafter referred to as D1, there is known (see abstract and figure) a battery comprising:  
(a) a container 3 having a positive terminal and a negative terminal;  
(b) an electrochemical cell 1 disposed within said container 3, said cell having a positive electrode, a negative electrode, and a cell voltage measured across said positive and said negative electrodes of said cell; and  
© a housing 41 containing electronic circuitry 31 associated with said container, said electronic circuitry electrically connected between said electrodes of said cell and said terminals of said container to create an output voltage measured across said positive and said negative terminals of said container.  
Thus, the subject-matter of claim 1 is not novel.
2. The subject-matter of the characterizing feature of claim 2 is also known from D1; see figure.
3. Dependent claims 3-10 do not appear to contain any additional features which involve an inventive step when combined with the subject matter of any claim to which it refers.

With respect to Section VII.

1. The features of the claim/s are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

## PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

REED, T., David  
The Procter & Gamble Company  
5299 Spring Grove Avenue  
Cincinnati, OH 45217-1087  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 10 August 2000 (10.08.00)	
Applicant's or agent's file reference 7630/JB	IMPORTANT NOTIFICATION
International application No. PCT/US00/17007	International filing date (day/month/year) 20 June 2000 (20.06.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 21 June 1999 (21.06.99)
Applicant THE PROCTER & GAMBLE COMPANY et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
21 June 1999 (21.06.99)	60/140.092	US	17 July 2000 (17.07.00)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

S. De Michiel

Telephone No. (41-22) 338.83.38

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/EP

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only		
Identification of IPEA		Date of receipt of DEMAND
<b>Box No. 1 IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference 7630/JB
International application No. PCT/US00/17007	International filing date 20 June 2000 (20.06.00)	(Earliest) Priority date 21 June 1999 (21.06.99)
Title of Invention Battery Having A Housing for Electronic Circuitry		
<b>Box No. II APPLICANT(S)</b>		
Name and address:  THE PROCTER & GAMBLE COMPANY One Procter & Gamble Plaza Cincinnati, Ohio 45202 US		Telephone No. 513-627-7025 Facsimile No. 513-627-6333 Teleprinter No.
State (i.e. country) of nationality: US		State (i.e. country) of residence: US
Name and address: GARTSTEIN, Vladimir 11187 Huntwicke Place Cincinnati, Ohio 45241 US		
State (i.e. country) of nationality: US		State (i.e. country) of residence: US
Name and address: NEBRIGIC, Dragan Danilo 4115 Mill Crest Drive Indian Springs, Ohio 45011 US		
State (i.e. country) of nationality: YU		State (i.e. country) of residence: US
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.		

## Continuation of Box No. II APPLICANT(S)

*If none of the following sub-boxes is used, this sheet should not be included in the demand.*

## Name and address:

BARTSCH, Eric Richard  
4947 Lord Alfred Court  
Cincinnati, Ohio 45241  
US

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

## Name and address:

PETERSON, Robert James  
6337 Belmont Road  
Loveland, Ohio 45140  
US

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

## Name and address:

HUANG, Chow-Chi  
8138 Glenridge Court  
West Chester, Ohio 45069  
US

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

## Name and address:

SCHMIDT, Edward Lawrence  
136 Spyglass Court  
Cincinnati, Ohio 45238  
US

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

☐ Further applicants are indicated on another continuation sheet.

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address:

T. DAVID REED/TIMOTHY B. GUFFEY  
THE PROCTER & GAMBLE COMPANY  
5299 Spring Grove Avenue  
Cincinnati, OH 45217-1087  
US

Telephone No.  
513-627-7025  
Facsimile No.  
513-627-6333  
Teleprinter No.

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**

Statement concerning amendments:\*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☒ as originally filed

☐ as amended under Article 34

the claims ☒ as originally filed

☐ as amended under Article 19 (together with any accompanying statement)

☐ as amended under Article 34

the drawings ☒ as originally filed (if the original application included drawings)

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)).  
(This check-box may be marked only where the time limit under Article 19 has not yet expired.)

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT) excluding the following States which the applicant wishes not to elect:

**Box No. VI CHECK LIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |   |   |        |
|---|---|--------|
| 1. translation of international application                             | : | sheets |
| 2. amendments under Article 34  | : | sheets |
| 3. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter   | : | sheets |
| 6. other ( <i>specify</i> )   | : | sheets |

For International Preliminary  
Examining Authority use only

received	not received
----------	--------------

- |                          |                          |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other ( <i>specify</i> ):   |

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**


T. David Reed  
Patent Agent

**For International Preliminary Examining Use only**

1. Date of actual receipt of DEMAND:
2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):
3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been Informed accordingly.
4. ☐ The date of receipt of demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5
5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

**For International Bureau Use only**

Demand received from IPEA on:



## Payment of fees and costs

European Patent Office  
Directorate  
Cash and Accounts  
D - 80298 München

Please complete using a typewriter or a word processor

Name of payer T. David Reed/Timothy B. Guffey
The Procter & Gamble Company
Address 5299 Spring Grove Avenue
Cincinnati, OH 45217

Payer's reference

7630/JB

Mode of payment

☐ Bank/Giro transfer ①

Bank/Giro Office

☐ Enclosed cheque No.

☒ Debit from deposit account  
with the EPO is requested ②

Deposit account No  
2802.0021

Patent application / Patent No. (A separate form is required for each application)

Purpose of  
payment

EP

PCT US00/17007

Explanations:

Code

Currency③

Amount

① Payment must be made without charge to the payee. For European Patent Organisation accounts and corresponding currencies of payment see overleaf.

② Debits from deposit accounts with the European Patent Office may only be made in DEM.

③ Payments must be made in the currency of the State in which the EPO account in question is held. Please use the abbreviations for currencies of payment shown overleaf.

④ Contracting States should only be specified if they differ from those designated in box 33 of EPO Form 1001 (Request for Grant) or in box V of PCT Form RO/101.

⑤ When extension fees are paid, the States for which they are intended must be specified.

001	Filing fee
002	Search fee
005	Designation fee(s)④
015	Claims fee(s) (Rule 31 (1) EPC)
055	Additional copy
006	Examination fee
007	Fee for grant including fee for printing (up to 35 pages)
008	Additional fee for printing (more than 35 pages)
033	Renewal fee for the 3rd year
034	Renewal fee for the 4th year
035	Renewal fee for the 5th year
	Extension fee(s) for⑤:
021	Preliminary Examination Fee
224	Handling Fee

EUR	1533
EUR	148
Total	EUR 1681

Signature

T. David Reed/Patent Agent

EPA Form 1010 12.95

Place, Date CINCINNATI, OH 45202 USA

② 9.12.00

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No. \_\_\_\_\_

International Filing Date \_\_\_\_\_

Name of receiving Office and "PCT International Application" \_\_\_\_\_

Applicant's or agent's file reference  
(if desired) (12 characters maximum) 7630/JB

### Box No. I TITLE OF INVENTION

Battery Having a Housing for Electronic Circuitry

### Box No. II APPLICANT

Name and address:

THE PROCTER & GAMBLE COMPANY  
One Procter & Gamble Plaza  
Cincinnati, Ohio 45202  
US

☐ This person is also inventor.

Telephone No.  
513-627-7025

Facsimile No.  
513-627-6333

Teleprinter No. \_\_\_\_\_

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☒ all designated States except ☐ the United States ☐ the States indicated in  
for the purposes of: states the United States of America of America only the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address:

GARTSTEIN, Vladimir  
11187 Huntwicke Place  
Cincinnati, Ohio 45241  
US

This person is:

☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this  
check-box is marked, do not fill in  
below.)

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated in  
for the purposes of: states the United States of America of America only the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf  
of the applicant(s) before the competent International Authorities as:

☒ agent ☐ common representative

Name and address:

REED, T. David/HUGHETT, Eileen L.  
The Procter & Gamble Company  
5299 Spring Grove Avenue  
Cincinnati, OH 45217-1087  
US

Telephone No.  
513-627-7025

Facsimile No.  
513-627-6333

Teleprinter No. \_\_\_\_\_

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.



## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address:

NEBRIGIC, Dragan Danilo  
4115 Mill Crest Drive  
Indian Springs, Ohio 45011  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

YU

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated in  
 for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

BARTSCH, Eric Richard  
4947 Lord Alfred Court  
Cincinnati, Ohio 45241  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated in  
 for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

PETERSON, Robert James  
6337 Belmont Road  
Loveland, Ohio 45140  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated in  
 for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

HUANG, Chow-Chi  
8138 Glenridge Court  
West Chester, Ohio 45069  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated in  
 for the purposes of: states the United States of America of America only the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address:

SCHMIDT, Edward Lawrence  
136 Spyglass Court  
Cincinnati, Ohio 45238  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

US

State (i.e. country) of residence:

US

This person is applicant ☐ all designated ☐ all designated States except ☒ the United States ☐ the States indicated In  
for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant ☐ all designated ☐ all designated States except ☐ the United States ☐ the States indicated In  
for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant ☐ all designated ☐ all designated States except ☐ the United States ☐ the States indicated In  
for the purposes of: states the United States of America of America only the Supplemental Box

Name and address:

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant ☐ all designated ☐ all designated States except ☐ the United States ☐ the States indicated In  
for the purposes of: states the United States of America of America only the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

## Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) mark the applicable check-boxes: at least one must be marked):

## Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates                  | <input checked="" type="checkbox"/> LR Liberia                                   |
| <input checked="" type="checkbox"/> AL Albania                               | <input checked="" type="checkbox"/> LS Lesotho                                   |
| <input checked="" type="checkbox"/> AM Armenia                               | <input checked="" type="checkbox"/> LT Lithuania                                 |
| <input checked="" type="checkbox"/> AT Austria and utility model             | <input checked="" type="checkbox"/> LU Luxembourg                                |
| <input checked="" type="checkbox"/> AU Australia                             | <input checked="" type="checkbox"/> LV Latvia                                    |
| <input checked="" type="checkbox"/> AZ Azerbaijan                            | <input checked="" type="checkbox"/> MA Morocco                                   |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina                | <input checked="" type="checkbox"/> MD Republic of Moldova                       |
| <input checked="" type="checkbox"/> BB Barbados                              | <input checked="" type="checkbox"/> MG Madagascar                                |
| <input checked="" type="checkbox"/> BG Bulgaria                              | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BR Brazil                                | <input checked="" type="checkbox"/> MN Mongolia                                  |
| <input checked="" type="checkbox"/> BY Belarus                               | <input checked="" type="checkbox"/> MW Malawi                                    |
| <input checked="" type="checkbox"/> CA Canada                                | <input checked="" type="checkbox"/> MX Mexico                                    |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> NO Norway                                    |
| <input checked="" type="checkbox"/> CN China                                 | <input checked="" type="checkbox"/> NZ New Zealand                               |
| <input checked="" type="checkbox"/> CR Costa Rica                            | <input checked="" type="checkbox"/> PL Poland                                    |
| <input checked="" type="checkbox"/> CU Cuba                                  | <input checked="" type="checkbox"/> PT Portugal                                  |
| <input checked="" type="checkbox"/> CZ Czech Republic and utility model      | <input checked="" type="checkbox"/> RO Romania                                   |
| <input checked="" type="checkbox"/> DE Germany and utility model             | <input checked="" type="checkbox"/> RU Russian Federation                        |
| <input checked="" type="checkbox"/> DK Denmark and utility model             | <input checked="" type="checkbox"/> SD Sudan                                     |
| <input checked="" type="checkbox"/> DM Dominica                              | <input checked="" type="checkbox"/> SE Sweden                                    |
| <input checked="" type="checkbox"/> EE Estonia and utility model             | <input checked="" type="checkbox"/> SG Singapore                                 |
| <input checked="" type="checkbox"/> ES Spain                                 | <input checked="" type="checkbox"/> SI Slovenia                                  |
| <input checked="" type="checkbox"/> FI Finland and utility model             | <input checked="" type="checkbox"/> SK Slovakia and utility model                |
| <input checked="" type="checkbox"/> GB United Kingdom                        | <input checked="" type="checkbox"/> SL Sierra Leone                              |
| <input checked="" type="checkbox"/> GD Grenada                               | <input checked="" type="checkbox"/> TJ Tajikistan                                |
| <input checked="" type="checkbox"/> GE Georgia                               | <input checked="" type="checkbox"/> TM Turkmenistan                              |
| <input checked="" type="checkbox"/> GH Ghana                                 | <input checked="" type="checkbox"/> TR Turkey                                    |
| <input checked="" type="checkbox"/> GM Gambia                                | <input checked="" type="checkbox"/> TT Trinidad and Tobago                       |
| <input checked="" type="checkbox"/> HR Croatia                               | <input checked="" type="checkbox"/> TZ United Republic of Tanzania               |
| <input checked="" type="checkbox"/> HU Hungary                               | <input checked="" type="checkbox"/> UA Ukraine                                   |
| <input checked="" type="checkbox"/> ID Indonesia                             | <input checked="" type="checkbox"/> UG Uganda                                    |
| <input checked="" type="checkbox"/> IL Israel                                | <input checked="" type="checkbox"/> US United States of America                  |
| <input checked="" type="checkbox"/> IN India                                 | <input checked="" type="checkbox"/> UZ Uzbekistan                                |
| <input checked="" type="checkbox"/> IS Iceland                               | <input checked="" type="checkbox"/> VN Viet Nam                                  |
| <input checked="" type="checkbox"/> JP Japan                                 | <input checked="" type="checkbox"/> YU Yugoslavia                                |
| <input checked="" type="checkbox"/> KE Kenya                                 | <input checked="" type="checkbox"/> ZA South Africa                              |
| <input checked="" type="checkbox"/> KG Kyrgyzstan                            | <input checked="" type="checkbox"/> ZW Zimbabwe                                  |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea |  |
| <input checked="" type="checkbox"/> KR Republic of Korea                     |  |
| <input checked="" type="checkbox"/> KZ Kazakhstan                            |  |
| <input checked="" type="checkbox"/> LC Saint Lucia                           |  |
| <input checked="" type="checkbox"/> LK Sri Lanka                             |  |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all the designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that a designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

<b>Box No. VI PRIORITY CLAIM</b>					<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:			
		national application: country	regional application: regional Office	intl. application: receiving Office	
item (1) (21.06.99) 21 June 1999	60/140,092	US			
Item (2)					
item (3)					
<input type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): _____ <small>*Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii). See Supplemental Box.</small>					
<b>Box No. VII INTERNATIONAL SEARCHING AUTHORITY</b>					
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested) from the International Searching Authority: Date (day/month/year)      Number      Country (or regional Office)			
ISA/EP					
<b>Box No. VIII CHECK LIST: LANGUAGE OF FILING</b>					
This international applications contains the following number of sheets:		This international application is accompanied by the item(s) marked below:			
request	: 05	1. <input checked="" type="checkbox"/> fee calculation sheet			
description (excluding sequence listing part)	: 10	2. <input type="checkbox"/> separate signed power(s) of attorney			
claims	: 02	3. <input checked="" type="checkbox"/> 5 copy(ies) of general power attorney: reference number, if any:			
abstract	: 01	4. <input type="checkbox"/> statement explaining lack of signature			
drawings	: 05	5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): (C1)			
sequence listing part of description	: 00	6. <input type="checkbox"/> translation of international application into (language):			
Total Number of Sheets:	: 23	7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material			
		8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form			
		9. <input checked="" type="checkbox"/> other (specify): postcard			
Figure of drawings which should accompany the abstract: 1		Language of Filing of the international application: English			
<b>Box No. IX SIGNATURE OF APPLICANT OR AGENT</b>					
T. David Reed					

<b>For receiving Office Use only</b>		<b>2. Drawings</b>  <input type="checkbox"/> received:  <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA/EP		6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.

<b>For International Bureau Use only</b>	
Date of receipt of the record copy by the International Bureau:	
Form PCT/RO/101 (last sheet) (5 July 1998)	

See Notes to the request form

This sheet is not part of and does not count as a sheet of the international application.

# PCT

## FEE CALCULATION SHEET Annex to the Request

For receiving Office use only

International application No.

Applicant's or agent's  
file reference

7630/JB

Date stamp the receiving Office

Applicant

THE PROCTER & GAMBLE COMPANY

### CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE ..... \$ 240 T

2. SEARCH FEE ..... \$990 S

International search to be carried out by EP

3. INTERNATIONAL FEE

#### Basic Fee

International application contains 23 sheets

first 30 sheets ..... \$427 b1

0 x \$10 = 0 b2

remaining sheets additional amount

Add amount entered at b1 and b2 and enter total at B 427 B

#### Designation Fees

The international application contains 83 designations.

8 x \$92 = \$736 D

number of designation  
fees payable (max. 8) amount of designation fee

Add amounts entered at B and D and enter at I 1163 I

4. FEE FOR PRIORITY DOCUMENT (if applicable) (\$15 ea.) 0 P

5. TOTAL FEES PAYABLE ..... 2393

Add amounts entered at T., S., I and P, and enter total in the TOTAL box

TOTAL

☐ The designation fees are not paid at this time.

### MODE OF PAYMENT

☒ authorization to charge  
deposit account (see below)

☐ bank draft

☐ coupons

☐ cheque

☐ cash

☐ other (specify):

☐ post money order

☐ revenue stamps

### DEPOSIT ACCOUNT AUTHORIZATION (this mode of payment may not be available at all receiving Offices)

The RO/ US

☒ is hereby authorized to charge the total fees indicated above to my deposit account

☒ is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account

☒ hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

16-2485

Deposit Account No.

2010600  
Date (day/month/year)

(Signature)

T. David Reed, U.S. Reg. 32931

## GENERAL POWER OF ATTORNEY

We. **The Procter & Gamble Company**  
One Procter & Gamble Plaza  
Cincinnati, Ohio 45202  
United States of America

hereby appoint:

<b>Reed, T. David</b>	<b>32,931</b>
<b>Hughett, Eileen L.</b>	<b>34,352</b>
<b>Sivik, Linda M.</b>	<b>44,982</b>
<b>Guffey, Timothy B.</b>	<b>41,048</b>

all of 5299 Spring Grove Avenue, Cincinnati, Ohio 45217, as agents, with full power of substitution to act on our behalf before all competent international authorities in connection with any and all international applications filed by us with either The United States Patent and Trademark Office or the PCT International Bureau of WIPO as receiving office for international applications filed under the Patent Cooperation Treaty, and to make or receive payments on our behalf.

Signed in Hamilton County, State of Ohio, U.S.A., the 10th day of April 2000.

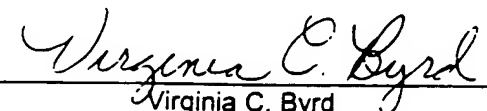
**THE PROCTER & GAMBLE COMPANY**

  
\_\_\_\_\_  
Jacobus C. Rasser  
Assistant Secretary

STATE OF OHIO                   )  
  ) ss  
COUNTY OF HAMILTON        )

On this 10th day of April 2000, personally appeared before me Jacobus C. Rasser, to me personally known, who executed the foregoing instrument in my presence and acknowledged the execution thereof as his free and voluntary act and deed for the uses and purposes therein set forth and expressed.



  
\_\_\_\_\_  
Virginia C. Byrd  
Notary Public, State of Ohio  
My Commission Expires October 2, 2000

PATENT COOPERATION TREATY  
(Appointment of Agent or Common Representative)  
POWER OF ATTORNEY

The undersigned applicant:

Edward Lawrence Schmidt  
136 Spyglass Court  
Cincinnati, OH 45238

hereby appoints:

**Hasse, Donald E.**  
**Reed, T. David**  
**Hughett, Eileen L.**  
**Guffey, Timothy B.**  
**Hiland, Emelyn L.**

U.S. Registration No.

**29,387**  
**32,931**  
**34,352**  
**41,048**  
**41,501**

as attorney/agent to act on behalf, with full power of substitution, before all competent international authorities in connection with any and all international applications filed by with either the United States Receiving Office or The International Bureau of W.I.P.O. Receiving Office and to make or receive payments on behalf of the undersigned.

Signed at Cincinnati, OH  
on this 23<sup>rd</sup> day of February, 1998.

  
Edward Lawrence Schmidt

PATENT COOPERATION TREATY  
(Appointment of Agent or Common Representative)  
POWER OF ATTORNEY

The undersigned applicant:

Vladimir (NMN) Gartstein  
11187 Huntwick Place  
Cincinnati, Ohio 45241

hereby appoints:

Hasse, Donald E.  
Reed, T. David  
Hughett, Eileen L.

<u>U.S. Registration No.</u>
29,387
32,931
34,352

as agents to act on his/her behalf, with full power of substitution, before all competent international authorities in connection with any and all international application filed by him/her with either the United States Receiving Office or The International Bureau of W.I.P.O. Receiving Office and to make or receive payments on behalf of the undersigned.

Signed at Miami Valley Laboratories, Cincinnati, Ohio

on this 29 day of March 19 99

V. Gartstein  
Vladimir (NMN) Gartstein



PATENT COOPERATION TREATY  
(Appointment of Agent or Common Representative)  
POWER OF ATTORNEY

The undersigned applicant:

Dragan Danilo Nebrgic  
4115 Mill Crest Drive  
Indian Springs, Ohio 45011

hereby appoints:

Hasse, Donald E.  
Reed, T. David  
Hughett, Eileen L.

U.S. Registration No.  
29,387  
32,931  
34,352

as agents to act on his/her behalf, with full power of substitution, before all competent international authorities in connection with any and all international application filed by him/her with either the United States Receiving Office or The International Bureau of W.I.P.O. Receiving Office and to make or receive payments on behalf of the undersigned.

Signed at Miami Valley Laboratories, Cincinnati, Ohio

on this 24<sup>th</sup> day of March 19 99

  
Dragan Danilo Nebrgic

PATENT COOPERATION TREATY  
(Appointment of Agent or Common Representative)  
POWER OF ATTORNEY

The undersigned applicant:

Eric Richard Bartsch  
4947 Lord Alfred Court  
Cincinnati, OH 45241

(Complete name and address)

hereby appoints:

Hasse, Donald E.  
Reed, T. David  
Hughett, Eileen L.  
Guffey, Timothy B.  
Hiland, Emelyn L.

U.S. Registration No.

29,387  
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41,048  
P41,501

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Signed at West Chester, OH  
on this 29<sup>th</sup> day of July, 1999.



# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>7630/JB</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 00/ 17007</b>	International filing date (day/month/year) <b>20/06/2000</b>	(Earliest) Priority Date (day/month/year) <b>21/06/1999</b>
Applicant <b>THE PROCTER AND GAMBLE COMPANY</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

Internal Application No  
PCT/US 00/17007

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H01M10/48

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11, 26 December 1995 (1995-12-26) & JP 07 201358 A (SONY CORP), 4 August 1995 (1995-08-04) abstract ---	1,2
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

23 October 2000

Date of mailing of the international search report

30/10/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

De Vos, L

## INTERNATIONAL SEARCH REPORT

Internat Application No

PCT/US 00/17007

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International Application No

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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International Bureau



7630

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28 December 2000 (28.12.2000)

PCT

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**WO 00/79635 A1**

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**60/140,092** **21 June 1999 (21.06.1999)** **US**

(71) Applicant (for all designated States except US): **THE PROCTER & GAMBLE COMPANY [US/US];** One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GARTSTEIN, Vladimir [US/US];** 11187 Huntwicke Place, Cincinnati, OH 45241 (US). **NEBRIGIC, Dragan, Danilo [YU/US];**

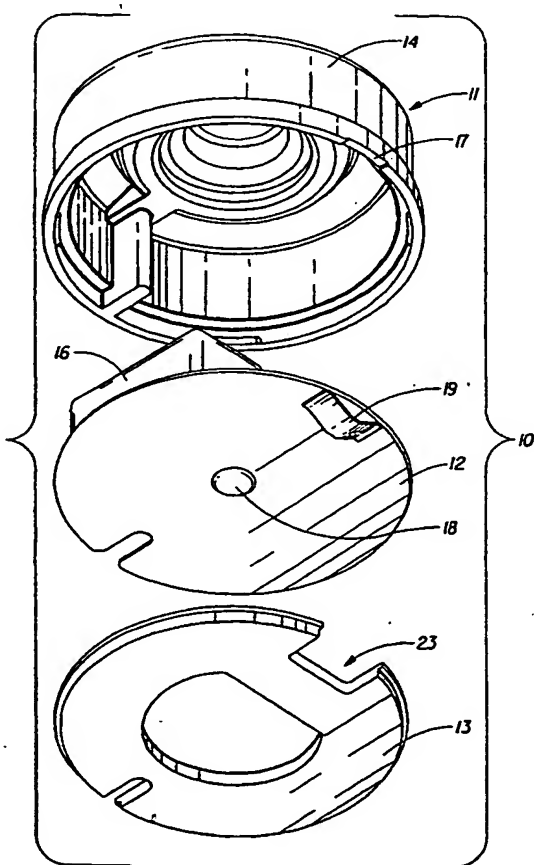
4115 Mill Crest Drive, Indian Springs, OH 45011 (US). **BARTSCH, Eric, Richard [US/US];** 4947 Lord Alfred Court, Cincinnati, OH 45241 (US). **PETERSON, Robert, James [US/US];** 6337 Belmont Road, Loveland, OH 45140 (US). **HUANG, Chow-Chi [US/US];** 8138 Glenridge Court, West Chester, OH 45069 (US). **SCHMIDT, Edward, Lawrence [US/US];** 136 Spyglass Court, Cincinnati, OH 45238 (US).

(74) Agents: **REED, T., David et al.;** The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087 (US).

(81) Designated States (national): **AE, AL, AM, AT, AT** (utility model), **AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ** (utility model), **DE, DE** (utility model), **DK, DK** (utility model), **DM, EE, EE** (utility model), **ES, FI, FI** (utility model), **GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL,**

[Continued on next page]

(54) Title: **BATTERY HAVING A HOUSING FOR ELECTRONIC CIRCUITRY**



(57) Abstract: The present invention provides a battery having a housing for electronic circuitry. The battery includes a container having a positive terminal and a negative terminal, an electrochemical cell and a housing containing electronic circuitry affixed to the container. The electronic circuitry is electrically connected to the electrochemical cell and terminals to create an output voltage measured across the terminals of the container.

WO 00/79635 A1



PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



**BATTERY HAVING A HOUSING FOR ELECTRONIC CIRCUITRY****FIELD OF THE INVENTION**

The present invention relates to batteries and more particularly to batteries having  
5 a housing for electronic circuitry, such as a built-in controller or an indicator for battery  
life.

**BACKGROUND OF THE INVENTION**

Consumers use batteries in portable electronic devices such as radios, compact  
10 disc players, cameras, cellular phones, electronic games, toys, pagers, and computer  
devices, etc. As electronic devices become faster and more complex, the devices have  
required more current than before. Consequently, the demands on batteries to provide  
greater utilization of stored energy are even greater. Co-pending applications referred to  
above disclose devices including a built-in controller capable of providing functions such  
15 as greater utilization of stored energy to extend the service run time of the battery, control  
of an electrochemical cell charge cycle by directly monitoring the electrochemical  
properties of that particular cell, providing a safety disconnect in the event of overheating,  
inverse polarity, short-circuit, over-pressure, over-charge, over-discharge or excessive  
hydrogen generation, and an indicator of remaining battery life to inform consumers of  
20 available stored energy. Developments such as these as well as others require electronic  
circuitry to be embedded inside a battery or somehow affixed to a battery.

However, there are many problems associated with having electronic circuitry  
embedded inside the battery. For example, if the electronic circuitry or electronic  
connections embedded in the battery are in contact with or are within the same container  
25 as the electrochemical components of the cell, these components may come into contact  
with the electronic circuitry or create a corrosive atmosphere that may cause damage to  
the electronic circuitry or electronic connections. Another problem is the electronic  
circuitry or electronic connections may cause electromagnetic interference (EMI) which  
may adversely affect the electronic devices within which the batteries are located. The  
30 electronic devices may also cause EMI which may adversely affect the electronic circuitry

within the battery. Another problem associated with having electronic circuitry embedded inside the battery is that the electronic circuitry is not as sturdy as the battery cell and is easily damaged if dropped or handled roughly by a consumer. Another problem is that it is difficult to ensure reliable electronic connections from the electronic circuitry to the positive and the negative electrodes of the electrochemical cell or the positive and negative terminals of the battery, which may be required for the electronic circuitry to function. Additionally, when the electronic circuitry is embedded inside the battery container, if the electronic circuitry fails, the entire battery may also fail. This may result in unnecessary waste of an otherwise operable electrochemical cell.

10

### **SUMMARY OF THE INVENTION**

The present invention provides a battery having a housing for electronic circuitry. The battery includes a container having a positive terminal and a negative terminal, an electrochemical cell and a housing containing electronic circuitry that is associated with the container. The electronic circuitry is electrically connected to the electrodes of the electrochemical cell and the terminals of the battery to create an output voltage measured across the terminals of the container.

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### **BRIEF DESCRIPTION OF THE DRAWINGS**

While the specification concludes with claims particularly pointing out and distinctly claiming the present invention, it is believed that the present invention will be better understood from the following description in conjunction with the accompanying drawings in which like reference numerals identify identical elements and wherein:

FIG. 1 is an exploded bottom perspective view of the main components of a housing according to the present invention;

20

FIG. 2 is an exploded top perspective view of the main components of a housing according to the present invention;

FIG. 3 is a bottom perspective view of an assembled housing of the present invention;

FIG. 4 is a bottom perspective view of a battery subassembly of the present invention;

FIG. 5 is perspective view of an assembled battery having a housing for electronic circuitry according to the present invention.

5

### **DETAILED DESCRIPTION OF THE INVENTION**

The present invention provides a housing for electronic circuitry that is affixed to a consumer battery. The term "battery," as used in this application, refers to a container having terminals and a single electrochemical cell, or a structure that has terminals and at least substantially contains two or more electrochemical cells (e.g., a standard 9 volt battery or a battery for a cellular telephone or laptop computer). The electrochemical cells need not be completely enclosed by a single structure if each cell has its own individual container. A portable telephone battery, for example, may contain two or more electrochemical cells that each have their own individual containers and are packaged together in a shrink-wrap plastic material that holds the individual containers together but may not completely enclose the individual containers of the cells. The term "consumer" in this application refers to a battery that is intended to be used in an electronic or electric device purchased or used by a consumer. The batteries of the present invention can be either primary or rechargeable. The term "primary" is used in this application and refers to a battery or an electrochemical cell that is intended to be discarded after its usable electrical storage capacity has been depleted (i.e., it is not intended to be recharged or otherwise reused). The terms "rechargeable" and "secondary" are used interchangeably in this application and refer to a battery or an electrochemical cell that is intended to be recharged at least once after its usable electrical storage capacity has been depleted (i.e., it is intended to be reused at least once).

25

#### **Housing for Electronic Circuitry**

FIG. 1 shows a bottom exploded perspective view of a particularly preferred embodiment of unassembled elements of a housing for a single-cell battery according to the instant invention. FIG 2 shows a top exploded perspective view of a particularly

30

preferred embodiment of the unassembled elements of a housing for a single-cell battery according to the instant invention. As used in this application, a "housing" refers to an assembly that houses electronic circuitry. In one aspect of the present invention, the electronic circuitry except for the input and output leads may be sealed inside the housing to protect the electronic circuitry components from the potentially corrosive or damaging electrochemical components of the cell. In another aspect of the present invention, the housing may be designed such that the housing for the electronic circuitry may be separately assembled and tested. Such a housing may then be assembled together with the battery container.

10 In a preferred embodiment of the instant invention, the housing 10 has three main elements: the bezel 11, the circuit board 12, and the retaining ring 13, as show in Figures 1 and 2.

The bezel 11 contains a body portion 14 and an output terminal 15. The output terminal 15 could be the output terminal of the battery or can be electrically connected to an output terminal of the battery. The body portion 14 of the bezel 11 is preferably molded of an insulating material that is impact-resistant, such as plastic, thermoplastic, polymer or polycarbonate. The impact-resistant bezel 11 provides protection for electronic circuitry 16 contained within the housing form static shock during manufacturing and mechanical shock such as dropping. The output terminal 15 is made of conductive material. In one preferred embodiment, the output terminal forms the positive terminal of the battery. Preferably, the output terminal 15 is metal and located in the center of bezel 11. Preferably, the body portion 14 of the bezel 11 is insert-molded around the output terminal 15. The bezel 11 preferably conforms to the shape and standard outer dimensions of a standard battery. For example, if the housing 10 is placed on the top of a AA size battery, the bezel 11 would preferably be dome-shaped, as shown in Figure 1. It is also preferable that at least a portion of the body portion 14 of the bezel 11 is made of translucent or transparent material so that the circuit board 13 may be easily viewed by a consumer after the housing 10 is assembled. Preferably, the bezel 11 contains a notch 17 to aid in aligning the bezel 11, circuit board 12 and retaining ring 13 during assembly of the housing 10.

The circuit board 12 comprises the electronic circuitry 16 to be utilized within the battery 10. Preferably, the circuit board 12 is made of Mylar or Kapton. The electronic circuitry 16 has at least three electrical contacts, a positive input contact 18, a negative input contact 19 and an output contact 20. Preferably, the positive input contact 18 is located in the center of the bottom of the board 12 and the negative input contact 19 is located at the bottom edge of the board 12. The negative input contact 19 may also be used to aid in aligning the bezel 11, circuit board 12 and retaining ring 13 during assembly. In a preferred embodiment, the output contact 20 of the circuit board 12 is a positive output contact that is electrically connected to the output terminal 15 of the bezel 11.

In an alternative embodiment, the housing output terminal forms the negative terminal of the battery. In this alternative embodiment, the output contact of the circuit board may be a negative output contact that is electrically connected to the negative output terminal of the battery. The circuit board may also include additional output contacts such as a second output contact. The second output contact of the circuit board may provide, for example, a negative output contact that is electrically connected to the negative terminal of the battery if the output contact is electrically connected to the positive terminal of the battery. This may allow for a virtual ground in which the negative terminal of the battery is isolated from the negative electrode of the electrochemical cell.

Another output contact may be an output contact for an indicator that is external to the housing. Such an output contact may be used to control an indicator such as the ones described in co-pending application U.S. Serial No. 09/275,495 filed on March 24, 1999, entitled BATTERY HAVING A BUILT-IN INDICATOR, naming Vladimir Gartstein and Dragan D. Nebrigic, which is incorporated by reference above.

Preferably, if at least a portion of the bezel 11 is translucent or transparent, the circuit board 12 may include an indicator such as an LED that a user may be able to see through the bezel 11 of the housing 10. In a preferred embodiment, the LED indicator may have several different colors to indicate various amounts of remaining battery life. For example, the color green may be used to indicate full capacity, yellow to indicate partial capacity, and red to indicate no capacity. In another preferred embodiment, at least

a portion of the bezel may be made of a flexible material such that the flexible portion of the bezel may form a "button" to activate an LED indicator. In yet another embodiment, the second output 20 contact may provide an output through which a device could receive information about the battery such as the remaining capacity of the electrochemical cell, or an output that may be used for quality assurance testing of an assembled housing or of an assembled battery.

The retaining ring 13 is preferably made of an insulating or dielectric material. The retaining ring 13 includes an opening 21 that allows the positive input contact 18 of the circuit board 12 to electrically connect to the positive electrode 26 of the electrochemical cell 22. The retaining ring 13 may further include a notch 23 to aid in aligning the bezel 11, circuit board 12 and retaining ring 13 during assembly.

Figure 3 shows a preferred embodiment of an assembled housing according to the instant invention. The bezel 11, circuit board 12, and retaining ring 13 are preferably assembled by placing the circuit board 12 inside the bezel 11. Preferably, the circuit board 12 is placed so that the electronic circuitry 16 is facing toward the bezel 11. Then, the retaining ring 13 is attached to the bottom of the bezel 11. The bezel 11, circuit board 12, and retaining ring 13 are preferably mechanically registered rotationally to align the bezel notch 17, the negative terminal contact 19, and the retaining ring notch 23. Preferably, the bezel 11, circuit board 12, retaining ring 13 are then attached together. Additionally, the housing 10 may be sealed, such as by a plug seal, a welded seal or a high impact pressure seal, to provide protection against the intrusion of moisture and/or particulates into the housing 10.

Because the housing 10 is assembled separately from the electrochemical cell 22, the housing 10 may be tested for operability independent of the electrochemical cell 22. If a housing is defective, the failed housing may be disposed of before it is combined with the electrochemical cell, thereby minimizing waste of inoperable batteries due to electronic circuitry 16 failure. Separately assembling the housing 10 also allows for cleaner assembly processes in a clean environment such as in a typical clean room used in electronic processing and assembly to prevent contamination or damage of the electronic components that might otherwise be impossible to achieve if the electronic component

were assembled on a battery assembly line. Also, the assembled housing 10 may be used with various types of electrochemical cells (i.e. alkaline, zinc carbon, metal air, NiCd, lithium, lithium ion, nickel metal hydride, etc.). These technical advantages allow the instant invention to be both cost effective and easily manufacturable.

5           As shown in FIG. 5, the assembled housing 10 containing the electronic circuitry 16 is physically and electrically connected to an electrochemical cell 22. The assembled housing is associated with the battery container 24. However, the housing 10 is separate from the electrochemical cell 22. Preferably, the housing forms or contains a separate compartment for housing the electronic circuitry apart from the electrochemical cell 22.

10          For example, the assembled housing may be either positioned on or positioned within the battery container 24. The assembled housing may be either affixed by any suitable attaching means to the electrochemical cell. "Attached" or "attaching means" includes, but is not limited to spot welding, crimping, adhesive, snap fitting, and interlocking, etc.

          As shown in FIG. 4, preferably, the assembled housing 10 is physically and

15          electrically connected to a battery container by means of a subassembly 25. Figure 4 shows a particularly preferred embodiment of a single-cell battery subassembly 25 of the instant invention. The battery container 24 contains a single electrochemical cell 22. The container 24 includes all the elements necessary to insulate and protect the positive 26 and the negative 27 electrodes, separator and the electrolyte of the electrochemical cell 22

20          from the environment and to provide electrical energy from the electrochemical cell 22 outside of the container 22. Thus, the container 24 in Figures 4 and 5 include a side wall 28, top 29 and bottom 30 caps, and positive 31 and negative 32 terminals that provide for electrical connection of the cell 22. The container 24 may be made of a combination of conducting material, such as metal, and insulating material, such as plastic or a polymer.

25          In the preferred embodiment, the physical and electrical connections are achieved by a retainer 33, a ground lead 34, and a false bottom 35.

          The retainer 33 provides a socket for mounting the housing 10. The retainer 33 is attached to the electrochemical cell 22 at the desired location of the housing 10. In a preferred embodiment, the retainer 33 is at the top of the electrochemical cell 22.

30          However, the retainer 33 may be attached to the bottom or the side of the electrochemical

cell 22. Preferably, the retainer 33 is spot welded to the battery container 22. Preferably the assembled housing 10 is attached to the retainer 33 such that the retaining ring and the retainer are affixed. Preferably, the housing 10 and retainer 33 are affixed by crimping, snapping, or adhesive. Preferably, the retainer 33 has a notch 38 to allow space for the  
5 ground lead 24 to connect the electronic circuitry 16 to the negative terminal 32.

The positive input contact 18 of the electronic circuitry is electrically connected to the positive electrode 26 of the electrochemical cell 22. The positive output contact 19 of the electronic circuitry 16 is electrically connected to the positive terminal 31. The negative input contact 19 is electrically connected to the negative electrode 27 of the  
10 electrochemical cell 22. In a preferred embodiment, the output contact 20 is positive and is electrically connected to the positive terminal 15 of the battery. In an alternative embodiment of the instant invention, the output contact 20 is negative and is electrically connected to the negative terminal of the battery. The terms "electrically connected" and "electrical connection" and "electrically coupled" refer to connections or couplings that  
15 allow for continuous flow.

The ground lead 34 is preferably a flexible strip comprising a conductive layer and an insulating layer. The ground lead 34 has a first end 36 and a second end 37. The conductive layer of ground lead 34 is oriented such that it faces away from the wall of the electrochemical cell 22. Preferably, the conductive layer is made of metal foil.  
20 Preferably, the insulating material is made of a thin polymer film. Preferably, the ground lead 34 is attached to the side 28 of the battery container 24 and is folded over the top 29 and bottom 30 of the container 24. The insulating material may have adhesive coated on it to provide a means for attaching the ground lead 34 to the battery container 24. The first end 36 of the ground lead 34 is attached to the output 20 of the circuit board 13. The  
25 ground lead 34 is folded through the retainer notch 38.

The false bottom 35 is a metal washer. The false bottom 35 attaches the second end 36 of the ground lead 34 to the bottom of the battery container to provide a ground. Further, the false bottom 35 provides a heat sink for the electronic circuitry.

Preferably, the battery having a housing containing electronic circuitry of the  
30 present invention conforms to the standard outer dimensions and a standard terminal



voltage of a conventional consumer battery. Thus, preferably the electrochemical cell 22 is slightly shorter than a conventional consumer battery to provide space for the housing 10 to allow the battery having a housing for circuitry that fits in and operates in standard electronic devices. It is also preferable that the slight shortening of the electrochemical cell minimizes the reduction of the volume of active electrochemistry.

### **Electronic Circuitry**

The housing 10 of the present invention contains one or more types of electronic circuitry 16. For example, the electronic circuitry 16 may be a controller that performs one or more of the following functions: greater utilization of stored energy to extend the service run time of the battery, control of an electrochemical cell charge cycle by directly monitoring the electrochemical properties of that particular cell, providing a safety disconnect in the event of overheating, inverse polarity, short-circuit, over-pressure, over-charge, over-discharge or excessive hydrogen generation, or an indicator of remaining battery life to inform consumers of available stored energy.

The electronic circuitry 16 of a battery of the present invention may perform one or more of the functions listed above. The electronic circuitry 16 of the present invention may contain one circuit that performs each of the desired functions, or may contain individual circuits that each perform one or more of the desired functions. In addition, the individual circuits may share circuitry such as sensing circuitry that may provide control signals to the individual circuits.

### **Batteries Having Housing for Electronic Circuitry**

The electrochemical cell(s) 22 of the instant of the instant invention may be either single-cell or multiple-cell.

The term "single-cell" refers to a battery having a single electrochemical cell packaged individually such as a standard AA, AAA, C or D type battery, or a single-cell in a multiple-cell battery (e.g., such as a standard 9 volt battery or a battery for a cellular telephone or laptop computer).

Multiple-cell batteries may include two or more of the same type of electrochemical cell, or include two or more different types of electrochemical cells in a hybrid battery. The multiple-cell battery of the present invention may contain electrochemical cells electrically arranged in series and/or in parallel. As used in this application, the term "hybrid battery" includes a multiple-cell battery that contains two or more voltaic cells of which at least two of those cells have different voltaic mechanisms such as photovoltaic, fuel, thermal, electrochemical, electromechanical, etc. or a different electrode, a different pair of electrodes or a different electrolyte. As used in this application term, "cell" is used to refer generally to voltaic cells used in a battery, including electrochemical cells. Also, voltaic or electro voltaic cell is used interchangeably and describes various physical mechanisms of generation of electricity including chemical. In addition, a hybrid cell may contain additional energy storage elements improving cell voltage and current discharge characteristics such as a super or ultra capacitor, high efficiency inductor, or low capacity secondary cell. The hybrid cell elements can be made to replace inactive cell construction elements such as label, seal, hollow terminals, etc.

In a first preferred embodiment, the electronic circuitry 16 of a single-cell battery may be electrically connected in series and/or parallel with the electrochemical cell(s) inside a housing attached to the container of a cell. In a second preferred embodiment, the electronic circuitry 16 of a multiple-cell battery may be packaged along with one or more of the individual cells as described with respect to a single-cell battery and/or may be packaged along with a combination of multiple cells such that the electronic circuitry is connected in series or in parallel with the combination of electrochemical cells.

Although particular versions and embodiments of the present invention have been shown and described, various modifications can be made to the battery having a housing for electronic circuitry without departing from the teachings of the present invention. The terms used in describing the invention are used in their descriptive sense and not as terms of limitation, it being intended that all equivalents thereof be included within the scope of the claims.

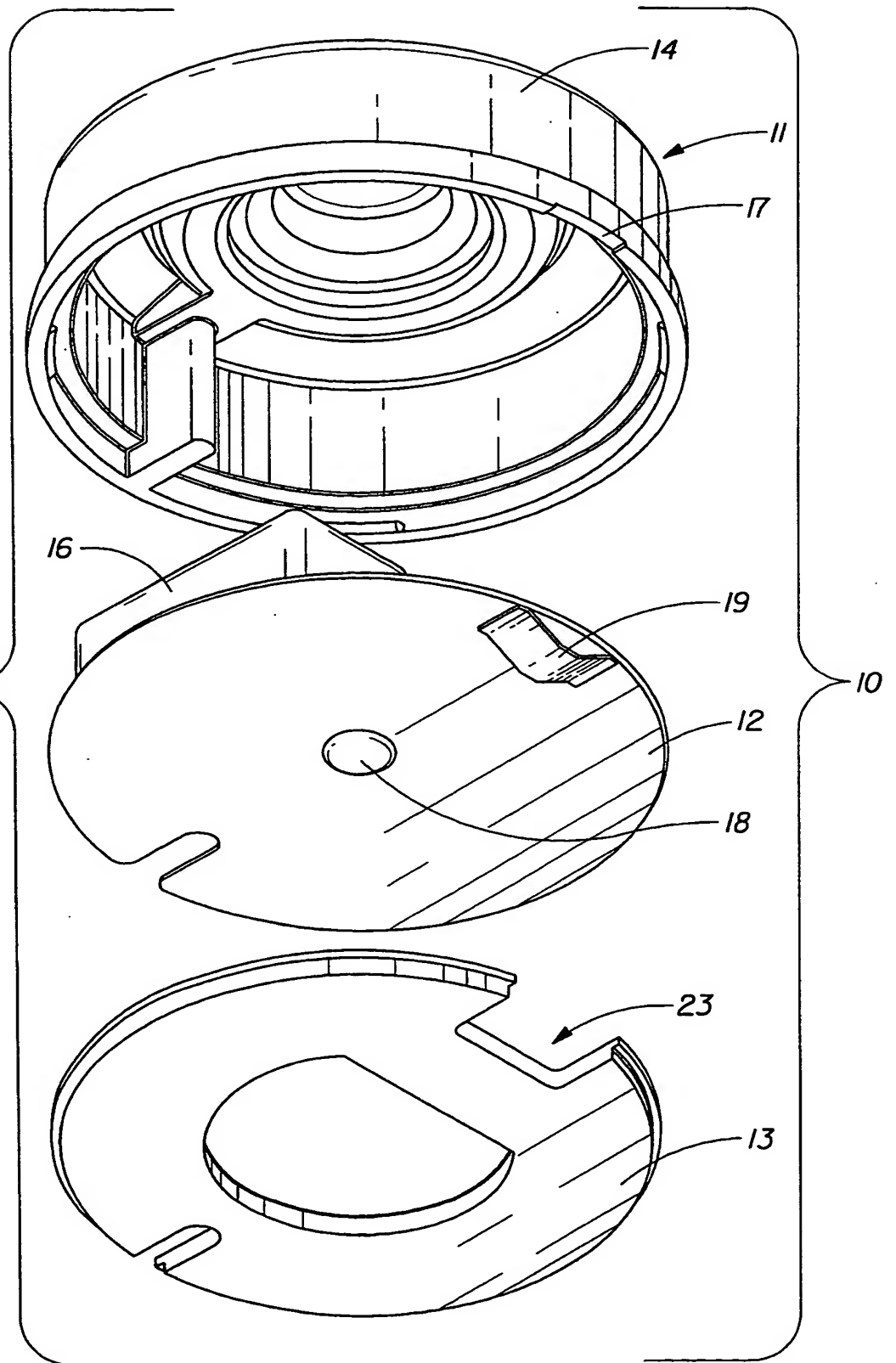
**WHAT IS CLAIMED IS:**

1. A battery comprising:
  - (a) a container having a positive terminal and a negative terminal;
  - (b) an electrochemical cell disposed within said container, said cell having a positive electrode, a negative electrode, and a cell voltage measured across said positive and said negative electrodes of said cell; and characterized in that
  - (c) a housing containing electronic circuitry associated with said container, said electronic circuitry electrically connected between said electrodes of said cell and said terminals of said container to create an output voltage measured across said positive and said negative terminals of said container.
2. The battery of Claim 1, wherein said electronic circuitry is substantially physically isolated from said electrochemical cell.
3. The battery of Claim 1, wherein said housing includes a bezel, a circuit board and a retaining ring, said bezel and said retaining ring form a compartment, said circuit board being located within said compartment.
4. The battery of Claim 3, wherein said compartment is sealed.
5. The battery of Claim 3, wherein at least a portion of said housing is translucent or translucent, and said circuit board includes a visual indicator.
6. The battery of Claim 3, wherein said bezel and said retaining ring include a notch.
7. The battery of Claim 3, wherein said circuit board includes a positive input contact, a negative input contact and an output contact electrically connected to said positive terminal or said negative terminal of said container.

8. The battery of Claim 3, further comprising a second output contact, said second output contact being electrically connected to one or more of the group of: an indicator external to said compartment and an external device.
9. The battery of Claim 3, wherein said bezel includes a button to activate an indicator.
10. The battery of Claim 3, wherein said circuit board includes a controller.

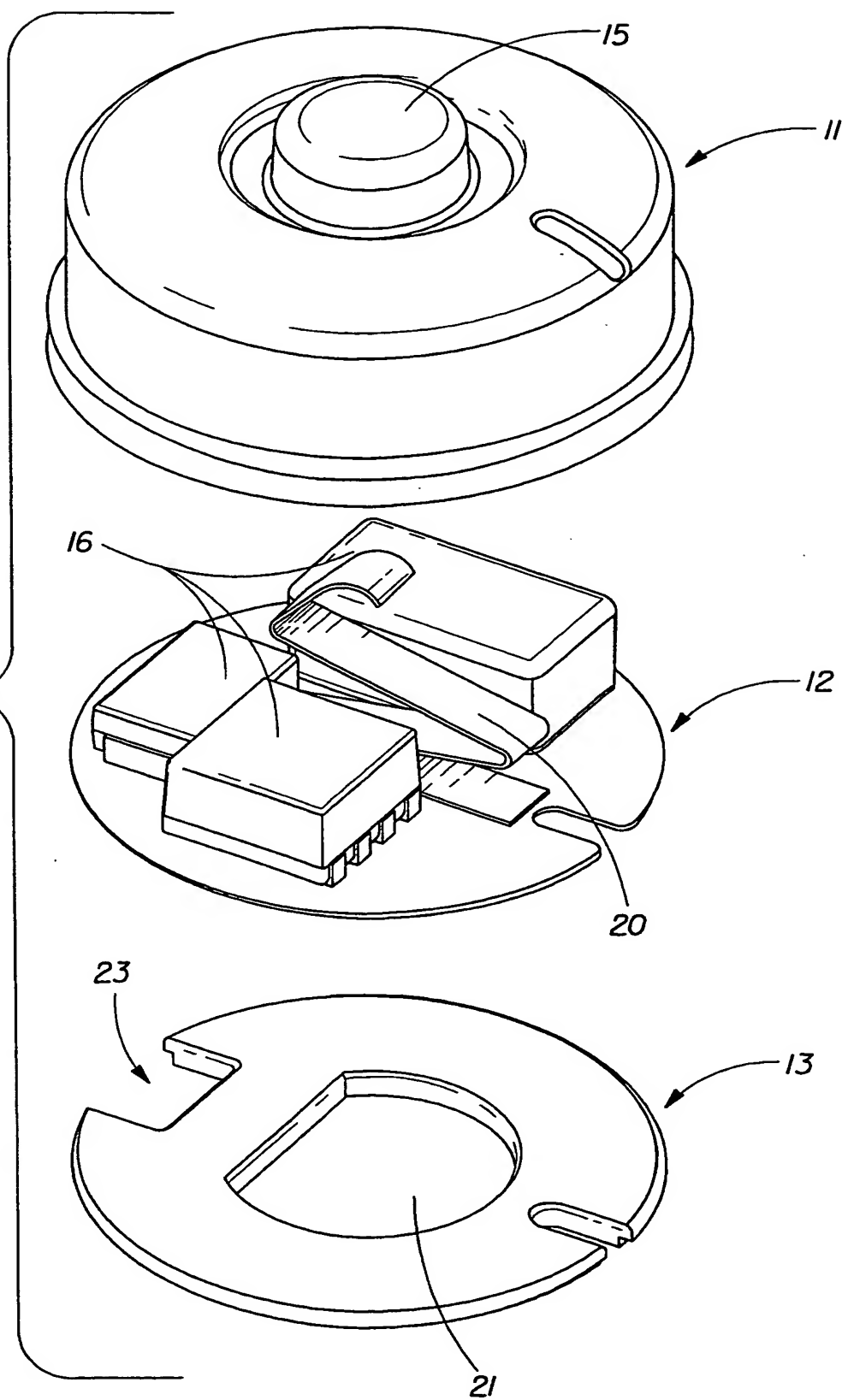
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Fig. 1



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Fig. 2



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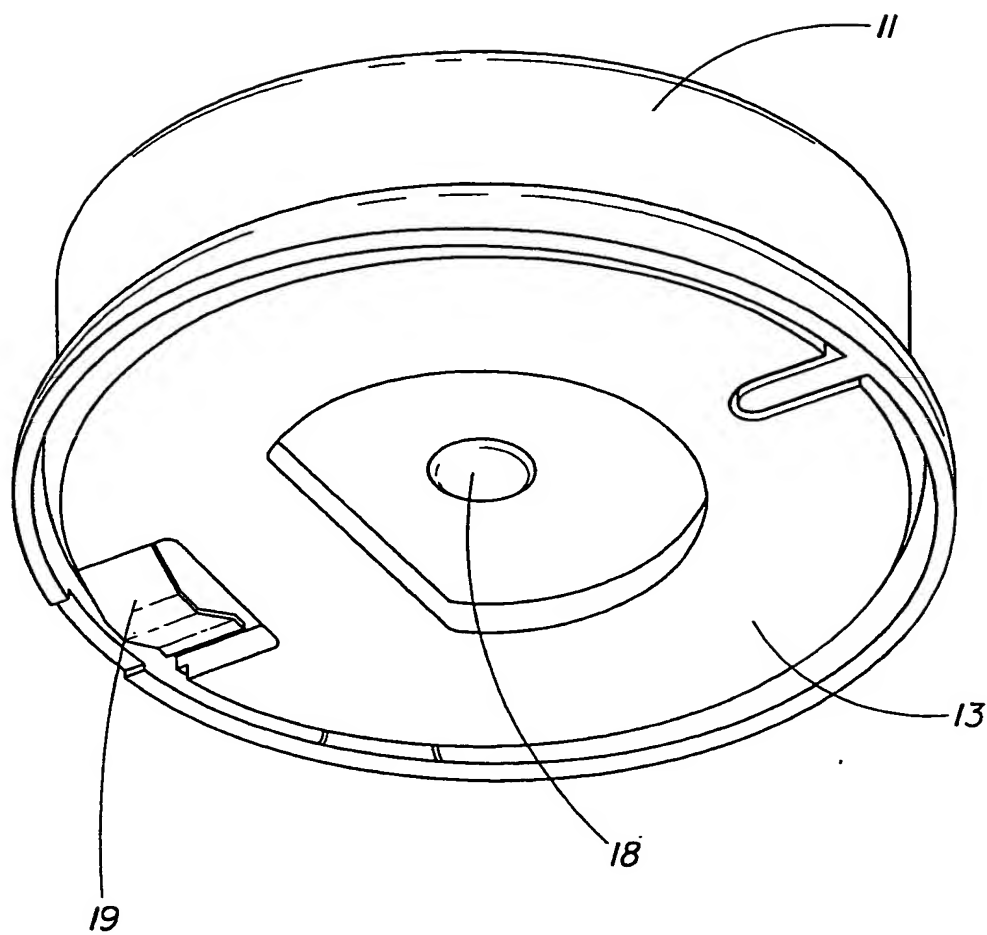


Fig. 3

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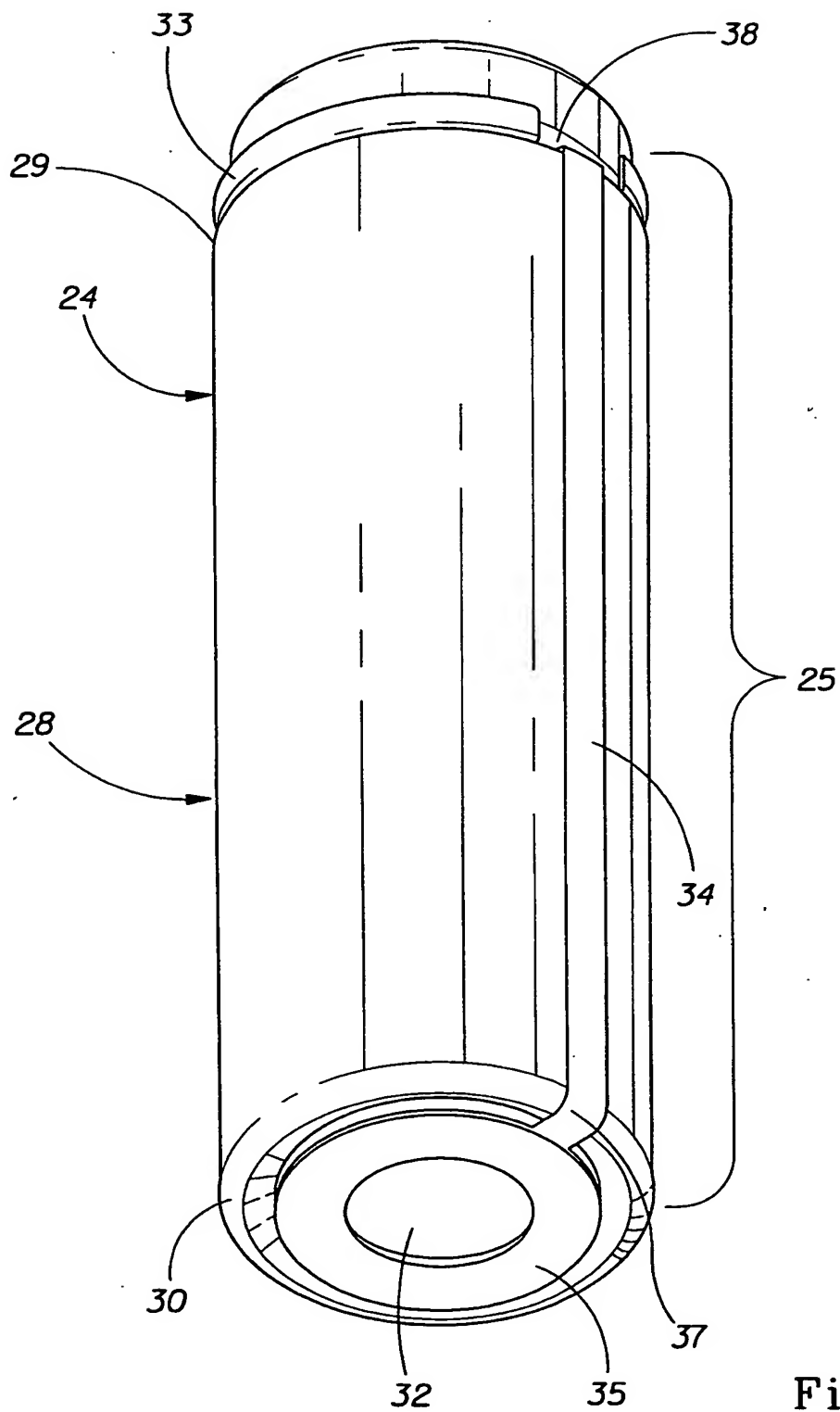


Fig. 4



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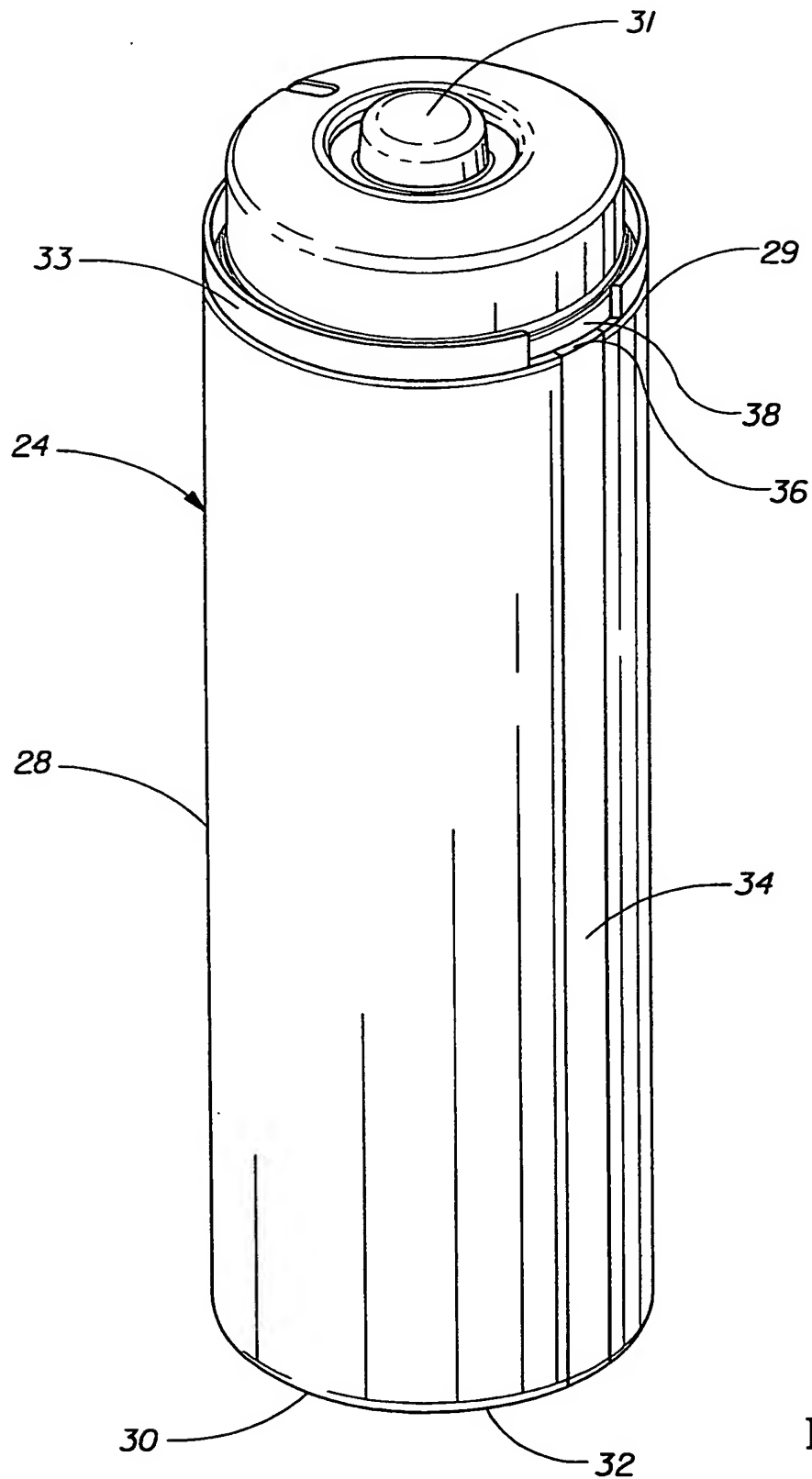


Fig. 5